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EXAMINER

PHAM, HAI CHI

ART UNIT	PAPER NUMBER
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2861

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/714,436	Applicant(s) ASSA ET AL. (me)	
	Examiner Hai C. Pham	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20,23-28 and 31-54 is/are rejected.
- 7) ☒ Claim(s) 21,22,29 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 19, 24-27 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Stamer et al. (U.S. 4,727,235).

Stamer et al., an acknowledged prior art, discloses a laser marking system and method for printing a code (e.g., alphanumeric codes shown in Fig. 2) on a moving product, which is conveyed past the laser head (10), the code being constructed from a plurality of pixels (dot matrix), wherein the order in which the pixels or dots are printed is prioritized such that the pixels are printed in a direction, which is opposite to the direction, which the product moves (each line of stroke is printed at a time and moves to the adjacent line of stroke in the direction opposite to the movement direction of the product) (Fig. 2).

Stamer et al. further teaches:

- the pixels or dots being arranged in a plurality of columns (or strokes) and prioritizing the order which the pixels are printed includes prioritizing each of the columns (or strokes) (Fig. 2),

- the printing system includes a laser mounted in a housing (laser head 10), the housing including an optics assembly (lens 14) configured to focus the printing beam onto the product (col. 2, lines 52-62),
- the housing including a printing beam exit member through which the printing exits the housing (the laser head including the beam delivery arm 12 and the lens 14, through which the laser beam is directed toward the moving product) (Fig. 1).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5-12, 33, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasebe et al. (U.S. 5,734,412) in view of Wiler et al.

Hasebe et al. discloses a scan type laser marking device and a method for printing, the device comprising a laser (1) for printing an alphanumeric code (mark M being a character or a graphic form) on a product (workpiece W or object 181) moving in a direction (direction B), the code being constructed from a plurality of pixels (the graphic form or mark having a plurality of dots) (col. 2, lines 43-57), and electronics (drive power source circuit 2 along with the optical system driving device 5 driving the galvanometer mirrors 3a, 3b) for printing the pixels on the product in a two dimensional trace (by two-dimensionally scanning the laser beam, Fig. 10) so as to form the code on

the product. Hasebe et al. further teaches the method for printing including generating a corrected data set (X and Y position correcting data) indicating the position that each pixel would occupy if each pixel was moved at the velocity of the product until the pixel is printed, and printing the code according to the corrected [coordinate] data set (col. 12, lines 19-30) (Figs. 10 and 11A-11C).

Hasebe et al. fails to teach continuously directing the printing beam to a plurality of locations on the material without deactivating the printing beam and varying the dwell time on the areas of the material to alter the optical characteristic of the material to form the code.

Wiler et al. discloses a scan type ablation apparatus for forming various informational and decorative designs ablated into the surface of a work piece laminate by impinging a laser beam in a scan manner while the work piece is moving (Figs. 6-7), wherein the dwell time of the laser beam at the selected areas of the surface is regulated by the control of the provided microprocessor (52) to achieve the desired ablation for the configuration selected through the keyboard (56) (col. 7, lines 2-28).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the control means for regulating the dwell time of the laser beam at the desired location in the device of Cameron et al. as taught by Wiler et al. The motivation for doing so would have been to achieve the desired ablation as suggested by Wiler et al.

With regard to claims 2, 3, 5, 7-9, 11, 12, Hasebe et al. also teaches printing the code according to the corrected [coordinate] data set including printing a two-

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dimensional trace or pixels or spots (Fig. 10), the laser being mounted in a housing (180, Fig. 7), which includes an optics assembly (condenser lens 4) to focus a printing beam produced by the laser onto the product positioned adjacent the housing, the first data set (original coordinate data) indicating the positions of the spots, and the corrected data set indicating the positions that each spot would occupy if each spot was moved along with the product until the spot was printed (Figs. 3A-3D, 10) (col. 11, lines 54-61).

With regard to claims 6, Hasebe et al. further teaches the housing including a printing beam exit member through which the printing beam exits the housing, and an aperture limiting the area (target area) within which the laser is able to print and the product moves past the aperture (beam outlet directed towards the object) (col. 10, lines 3-6).

5. Claims 4, 13-18, 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasebe et al. in view of Wiler et al., as applied to claims 1 and 10 above, and further in view of Stamer et al.

Hasebe et al., as modified by Wiler et al., discloses all the basic limitations of the claimed invention except for prioritizing the order in which the pixels are printed such that the pixels are printed in a direction, which is opposite to the direction, which the product moves.

Stamer et al. discloses a laser marking system and method for printing a code (e.g., alphanumeric codes shown in Fig. 2) on a moving product, which is conveyed

past the laser head (10), the code being constructed from a plurality of pixels (dot matrix), wherein the order in which the pixels or dots are printed is prioritized such that the pixels are printed in a direction, which is opposite to the direction, which the product moves (a series of dots is printed in order according to the direction of the movement of the product, i.e., a dot is printed at a time by a separate laser beam and moves to the adjacent location in the direction opposite to the movement direction of the product) (Fig. 2).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to set the priority for printing the pixels on the moving product in the device of Hasebe et al. as taught by Stamer et al. The motivation for doing so would have been to allow the marking beam to be accurately directed to the desired location on the moving product.

6. Claims 20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stamer et al. in view of Nakano et al. (U.S. 4,734,558).

Stamer et al. discloses all the basic limitations of the claimed invention except for the aperture.

Nakano et al. discloses in Fig. 2 a laser machining apparatus for marking a product (sample 4) with a laser (1), the apparatus includes an objective lens (24) for focusing the laser beam onto the product through an aperture (77), which serves to intercept undesirable scattered light from reaching the product.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate an aperture disposed close to the product in the device of Stamer et al. as taught by Nakano et al. The motivation for doing so would have been to prevent undesirable scattered light from reaching the product so as to promote high contrast in the marked pixels as suggested by Nakano et al. at col. 7, lines 30-35.

7. Claims 23 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stamer et al. in view of Hasebe et al. (U.S. 5,734,412).

Stamer et al. discloses all the basic limitations of the claimed invention except for the generation of the corrected data set indicating the positions that the pixels would occupy if each pixel were moved along with the product until the pixel was printed.

Hasebe et al. discloses a scan type laser marking device and a method for printing, the device comprising a laser (1) for printing an alphanumeric code (mark M being a character or a graphic form) on a product (workpiece W or object 181) moving in a direction (direction B), the code being constructed from a plurality of pixels (the graphic form or mark having a plurality of dots) (col. 2, lines 43-57), and electronics (drive power source circuit 2 along with the optical system driving device 5 driving the galvanometer mirrors 3a, 3b) for printing the pixels on the product in a two dimensional trace (by two-dimensionally scanning the laser beam, Fig. 10) so as to form the code on the product. Hasebe et al. further teaches the method for printing including generating a corrected data set (X and Y position correcting data) (col. 10, line 66 to col. 11, line 13)

indicating the position that each pixel would occupy if each pixel was moved at the velocity of the product until the pixel is printed, and printing the code according to the corrected [coordinate] data set (col. 12, lines 19-30) (Figs. 10 and 11A-11C).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the correction data generation in the device of Stamer et al. as taught by Hasebe et al. The motivation for doing so would have been to allow the pixels be accurately printed on a moving product as suggested by Hasebe et al. at col. 12, lines 29-30.

8. Claims 34-35, 39, 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stamer et al. in view of Loewenthal et al. (U.S. 5,294,942).

Stamer et al. discloses all the basic limitations of the claimed invention except for the density of the pixels being changed in response to a change in the velocity of the moving product, according to a reduced amount of the time available to print, and the change in the density of the pixels including the change in the number of printed spots.

Loewenthal et al. discloses a recording apparatus for printing on a recording medium that is moving at a variable rate wherein the density of the pixels is changed with the change of the speed of the moving recording medium or web, such density change being the number of sub-pixel exposures that changes with the change of the speed of the web since this number will depend upon the time available between consecutive scan lines (col. 4, line 22 to col. 5, line 2).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Stamer et al. with the aforementioned teachings of Loewenthal et al. The motivation for doing so would have been to allow the printing system to change the number of sub-pixels forming the spot to adapt to the variations of the speed of the moving object as suggested by Loewenthal at col. 5, lines 42-48.

9. Claims 40 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stamer et al. in view of Loewenthal et al., as applied to claims 34 and 41 above, and further in view of Nakano et al.

Stamer et al., as modified by Loewenthal et al., discloses all the basic limitations of the claimed invention except for the aperture.

Nakano et al. discloses in Fig. 2 a laser machining apparatus for marking a product (sample 4) with a laser (1), the apparatus includes an objective lens (24) for focusing the laser beam onto the product through an aperture (77), which serves to intercept undesirable scattered light from reaching the product.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate an aperture disposed close to the product in the device of Stamer et al. as taught by Nakano et al. The motivation for doing so would have been to prevent undesirable scattered light from reaching the product so as to promote high contrast in the marked pixels as suggested by Nakano et al. at col. 7, lines 30-35.

10. Claims 45-47 and 50-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cameron et al. (U.S. 5,767,483) in view of Wiler et al. (U.S. 5,478,426).

Cameron et al., discloses a method and apparatus for laser marking o body of material, the apparatus includes a continuous-wave carbon dioxide laser (10) that produces a continuous printing beam, an optics assembly (lenses 46, 48), and electronics for controlling the laser to alter an optical characteristic of the material to form spaced apart marks (e.g., localized stresses) forming the desired code on the product (Fig. 5) by continuously directing the laser beam at a constant speed relative to the material while maintaining the power density of the beam substantially constant and by varying the [dwell] time the beam spot is illuminating the desired locations on the surface of the material (it is noted that the longer the time the beam spot is illuminating the desired locations, the higher power density is obtained) (col. 2, lines 37-41). Cameron et al. further teaches the marks being not overlapped (Fig. 5).

Cameron et al. fails to teach wherein the electronics are configured to accept input that governs time spent by the printer beam dwelling at the locations to alter the optical characteristic.

Regardless, Wiler et al. discloses a method and apparatus for forming various informational and decorative designs ablated into the surface of a work piece laminate by impinging a laser beam, wherein the dwell time of the laser beam at the selected areas of the surface is regulated by the control of the provided microprocessor (52) to

achieve the desired ablation for the configuration selected through the keyboard (56) (col. 7, lines 2-28).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the control means for regulating the dwell time of the laser beam in the device of Cameron et al. as taught by Wiler et al. The motivation for doing so would have been to achieve the desired ablation as suggested by Wiler et al.

11. Claims 48-49 and 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cameron et al. in view of Wiler et al., as applied to claims 45 and 50 above, and further in view of Sato (U.S. 6,681,055).

Cameron et al., as modified by Wiler et al., discloses all the basic limitations of the claimed invention except for the spots being partially overlapped.

Sato discloses a method for forming two-dimensional code, which is formed with a plurality of non-overlapping cells (2), each having a plurality of dots (5), which can be formed in a partially overlapping manner in the case when the width of the cells is smaller than an integer number of dots (Figs. 21A-21B).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form partially overlapping spots in the device of Cameron et al. as taught by Sato. The motivation for doing so would have been to further enhance the contrast of the code.

Allowable Subject Matter

12. Claims 21-22 and 29-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of claims 21 and 29 is the inclusion therein, in combination as currently claimed, of the limitation “wherein the pixels are prioritized such that pixels that cross in front of the aperture earlier are given higher priority than pixels that cross in front of the aperture later as the product moves past the aperture”, which is not found taught by the prior art of record considered alone or in combination.

The primary reason for the indication of the allowability of claims 22 and 30 is the inclusion therein, in combination as currently claimed, of the limitation “wherein each of the pixels is constructed from a plurality of spots and wherein prioritizing the order in which the pixels are printed includes prioritizing the order in which the spots are printed in a direction opposite to the direction of the movement of the product”, which is not found taught by the prior art of record considered alone or in combination.

Response to Arguments

14. Applicant's arguments with respect to claims 1-20, 23-28 and 31-54 have been considered but are moot in view of the new grounds of rejection.

15. Applicant's arguments filed 12/12/05 have been fully considered but they are not persuasive.

Applicants argued that "Stamer does not describe prioritizing an order in which the pixels are printed" and that "the substrate can move in either direction, but there is no indication in Stamer that the pixels can be marked in an order other than shown". The examiner respectfully disagrees. Stamer clearly teaches the pixels being printed *in order* one at a time in the direction opposite to the direction of movement of the recording medium in the case when the conveyor moves towards the left (the stroke or vertical column of pixels always moving in the opposite direction to the conveying direction).

Applicants argued that "Hasebe's coordinate data does not indicate positions that pixels will occupy because the coordinate data output always stays ahead of the laser marking". However, the corrected coordinate data needs to be computed first in order to correctly position the pixels on the surface of the product.

Applicants further argued that "Hasebe does not disclose generating a corrected data set indicating positions that pixels would occupy". The examiner respectfully disagrees. Hasebe teaches in Fig. 10 the positions that the pixels would occupy within the x-y coordinates when the laser beam scans the surface of the product, and the x-coordinates of the above-mentioned pixels with respect to time (Fig. 11A). However, since the product is moving, the position of the product changes with time as shown in Fig. 11B, therefore, a corrected data for the positions of the pixels in time is required as shown in Fig. 11C.

Applicants argued that "Lowenthal does not link changes in pixel density with changes in the web speed". The examiner respectfully disagrees. Lowenthal exactly teaches adjusting the number of the sub-pixels to be recorded to form the pixel to adapt to the variations in the speed of the web (see Lowenthal, col. 5, lines 42-48).

Applicants also argued that the "periodic slowing (approximately sinusoidal velocity) does not constitute adjusting a dwell time at locations to which a laser beam is directed to form spots at the locations" in Cameron. The examiner respectfully disagrees. In order to increase the dwell time at locations to which a laser beam is directed to form spots, either the laser beam is at rest at the desired locations for the duration required by the dwell time or the scanning speed of the laser beam is considerably reduced at those locations. Cameron effectively teaches the laser beam scanning the locations at the slowest speed as indicated by the ends or zeros of the sinusoidal velocity of the scanning beam providing a sufficient dwell time to cause a change of the optical characteristic of the product, while the laser beam travels from one location to the next at a higher speed without causing the change of the optical characteristic of the product.

Pertinent Prior Art

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Brown (U.S. 6,462,303) discloses laser marking of golf balls, in which the dwell time of the laser beam at each point on the irradiated surface is controlled such that the material is ablated at that point.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM
PRIMARY EXAMINER
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